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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWNSHIP OF SARNIA

COUNTY OF LAMBTON

June, 1965

TOWNSHIP OF SARNIA - 1965  
COUNTY OF LAMBTON

TD  
380  
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1965  
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TD  
380  
.S27  
1965

Report on a water pollution  
survey of the township of  
Sarnia, county of Lambton.

80768

R E P O R T

on a

Water Pollution Survey

of the

Township of Sarnia

County of Lambton

June 10 and 16, 1965.

Division of Sanitary Engineering

R E P O R T

ONTARIO WATER RESOURCES COMMISSION

GENERAL

A water pollution survey of the Township of Sarnia was conducted by the Commission on June 10 and 16, 1965. This included the locating and sampling of surface-water drains and the receiving streams. Industries with significant waste discharges were investigated by the Commission's Division of Industrial Waste. The industries concerned will be discussed in a comprehensive report to be prepared by the OWRC dealing with a water quality survey of the St. Clair River in the Sarnia area.

The survey was previously reviewed with township officials and the local health authorities. A representative of the Lambton Health Unit was present during the field investigations.

THE TOWNSHIP OF SARNIA

The 1965 Ontario Municipal Directory reported that the 1964 assessed population of the township was 8,630. The more heavily populated areas extend from the north and east boundaries of the City of Sarnia.

Natural drainage is north to Lake Huron with some drainage to the St. Clair River. The major watercourses in the Township of Sarnia are listed on the following page.

Perch Creek, which flows into Lake Huron at Brights Grove;  
Pulse Creek and tributaries, which include the Wawanosh  
Drain and Waddell Creek; and

Talford Creek, which flows into the St. Clair River near  
the south limits of the City of Sarnia. This watercourse is of  
more importance to industries in Sarnia. Talford Creek was  
investigated by the Division of Industrial Waste and will not be  
discussed in this report since it serves only a small rural section  
of the township.

Previous investigations conducted by the Commission from  
January 1959 onwards, revealed that pollution problems exist in  
the community of Brights Grove and in the commercial district  
along London Road (Highway No. 7) east of Sarnia.

#### INTERPRETATION OF ANALYSES

In order to appreciate the significance of the laboratory  
analyses of samples obtained during the survey, the Commission's  
objectives are given.

The 5-day Biochemical Oxygen Demand (BOD) should not  
exceed 4 parts per million (ppm) in a stream or watercourse.  
A coliform count (Membrane Filter method) in excess of 2,400  
per 100 millilitres (ml) in a stream is regarded as indicative  
of pollution.

The objective for drain effluents is BOD and Suspended  
solids not in excess of 15 ppm. The presence of detergent is

associated with sanitary sewage discharges.

### INVESTIGATIONS

The following watercourses and storm drain outfalls were investigated. The weather was dry at this time. The analyses results are shown at each location.

#### Lake Huron

Five drain outfalls were investigated along the Lake Huron beach at Brights Grove.

##### LHST 8.10W Kenwich Street Drain

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	3.0	660	2	658	0.5	108,000

LHST 8.20W Beachwood Drain - There was visual evidence of sanitary sewage at the drain outfall.

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	80	776	262	514	6.6	13,000,000

It was quite evident that there were sanitary sewer connections to this drain.

LHST 8.40W Kettle Drain - Sanitary sewage was being discharged from the drain and onto the beach.

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	74	474	64	410	14.4	109,000,000

These results indicate serious pollution.

LHST 8.60W Outlet 50 yards (approx.) West of Gladys Street

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	21	460	29	431	23.5	460,000

These results reveal the presence of sanitary sewage.

LHST 8.70W Gladys Street Drain - An investigation of the drain outfall revealed the presence of sanitary sewage in the flow.

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	32	654	118	536	9.5	2,720,000

These results are indicative of pollution.

Perch Creek

Certain drains discharging into Perch Creek in the community of Brights Grove were investigated together with the receiving stream.

PCO.10 Perch Creek above Lake Huron

<u>Date</u>	5-Day BOD (ppm)	<u>SOLIDS</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Total (ppm)	Susp. (ppm)	Diss. (ppm)		
June 10/65	2.2	208	77	131	0.0	30,000

<u>Date</u>	Dissolved Oxygen (ppm)	Temperature (°C)
June 10/65	10	18

The waters of Lake Huron were flowing back into Perch Creek at this sampling point and these results therefore are not representative.



PC 0.10W Outfall North-East Side of Lakeshore Road Bridge

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 10/65	14	318	5	313	1.0	2,200,000

PC 0.11W Outfall South-East Side of Lakeshore Road Bridge

No Flow

PC 0.30 Perch Creek in the Vicinity of the Gallie Subdivision

Storm Drain

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 10/65	8.8	522	197	325	1.5	620,000

<u>Date</u>	<u>Dissolved Oxygen (ppm)</u>		<u>Temperature (°C)</u>	
June 10/65	4.5		24	

It would appear that the storm drain serving the area was recently repaired and the outlet was extended below the surface of the receiving stream. The results of a sample obtained in the vicinity of the outlet revealed serious pollution at this point. The dissolved oxygen test carried out at the time of sampling revealed serious oxygen depletion in the stream, which is also indicative of pollution.

PC 0.40S Hamilton Road Septic Tank Effluent

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 10/65	24	428	36	392	10.0	21,000,000

The laboratory examination of these samples revealed that inadequately treated sanitary sewage was being discharged into Perch Creek.

PC 0.50 Perch Creek Above Brights Grove

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> <u>(ppm)</u>	<u>Susp.</u> <u>(ppm)</u>	<u>Diss.</u> <u>(ppm)</u>		
June 10/65	2.2	484	13	471	0.1	120

<u>Date</u>	<u>Dissolved Oxygen (ppm)</u>	<u>Temperature (°C)</u>
June 10/65	13	24

These results indicate that Perch Creek was in satisfactory condition above Brights Grove at the time of sampling.

Pulse Creek

Several samples were obtained of drain effluents discharging into Pulse Creek and tributaries, the Wawanosh Drain and Waddell Creek.

PCC 0.20 Pulse Creek Above Lake Huron, at Lakeshore Road

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> <u>(ppm)</u>	<u>Susp.</u> <u>(ppm)</u>	<u>Diss.</u> <u>(ppm)</u>		
June 10/65	3.0	1102	51	1051	0.2	500

PWC 2.40 Wawanosh Drain at Highway No. 7

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> <u>(ppm)</u>	<u>Susp.</u> <u>(ppm)</u>	<u>Diss.</u> <u>(ppm)</u>		
June 16/65	5.6	80	15	65	1.5	18,000

PWC 2.41W North Outlet, North-East of Highway No. 7 Bridge

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> (ppm)	<u>Susp.</u> (ppm)	<u>Diss.</u> (ppm)		
June 16/65	5.6	928	8	920	0.3	97,000

These results did not reveal excessive pollution at the time of sampling.

PWC 2.42W Outlet at North-East Corner of Highway No. 7 Bridge

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> (ppm)	<u>Susp.</u> (ppm)	<u>Diss.</u> (ppm)		
June 16/65	0.5	1400	7	1393	0.1	260

There was no evidence of pollution in this drain.

PWC 2.40W Outlet North-West of Highway No. 7 Bridge

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> (ppm)	<u>Susp.</u> (ppm)	<u>Diss.</u> (ppm)		
June 16/65	1.6	3114	6	3108	0.1	510

The drain effluent was satisfactory at the time of sampling.

PWC 2.43W Outlet South-West of Highway No.7 Bridge

This is also referred to as the Exmouth Street drain which drains a section of the City of Sarnia.

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u> (ppm)	<u>Susp.</u> (ppm)	<u>Diss.</u> (ppm)		
June 16/65	5.0	832	8	824	0.9	49,000

A high coliform count and the presence of detergents was noted.

PWC 2.44W

No Flow

PWC 2.45W

No Flow

PWCW 2.90 Waddell Creek Above Junction with the Wawanosh Drain

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 16/65	18	710	72	638	6.0	190,000

These results revealed that the watercourse was in a damaged condition.

PWCW 3.00S Drain Outfall in the Vicinity of the Sahara Motel

Sanitary sewage was evident in the flow.

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 16/65	65	772	34	738	11.4	530,000

This drain was obviously contributing to the serious pollution of Waddell Creek.

PCC 3.60 Pulse Creek at Highway No. 7

The flow in the stream was quite low at this point.

<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS (ppm)</u>	<u>M.F.Coliform Count per 100 ml</u>
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
June 16/65	3.0	638	17	621	0.1	2,400

### REFUSE DISPOSAL SITE

The refuse disposal site serving the Township of Sarnia is located on Concession IX, Lot 32. No pollution problems are anticipated from this area.

### INDUSTRIAL WASTE

There were no serious industrial waste problems found at the time of this survey. As previously mentioned, a comprehensive report will be prepared by the Commission in the near future dealing with a water quality survey of the St. Clair River. Any industries in the Township of Sarnia with significant waste discharges to the St. Clair River will be discussed in the report.

### SUMMARY

A water pollution survey of the Township of Sarnia revealed pollution problems in the community of Brights Grove and in the commercial area along London Road (Highway No. 7) just east of the City of Sarnia.

The problems are particularly serious at Brights Grove, where inadequately treated sanitary sewage was being discharged into the storm drainage system. The drains discharge on the Lake Huron beach and into Perch Creek, which flows into the lake. This presents a definite health hazard to bathers and to persons served by the Petrolia water supply system. The water works intake is located approximately 1200 feet from the shore, and on certain occasions the turbid water of Perch Creek has been observed in the vicinity of

the intake. As indicated in previous Commission reports, septic tank and field tile disposal systems are considered unsuitable in the area due to the limited size of the building lots and heavy soil conditions. Brights Grove, a popular summer resort, has a permanent population of approximately 1,000, and increases to 1,500 or more during the summer. It is quite apparent that there is a great need for a municipal sewage collection and treatment system for the community.

Pollution problems were also evident in the commercial area along London Road, immediately east of Sarnia. Township officials should explore the possibility of extending the sanitary sewers serving the City of Sarnia to this area. Many of the motels in the area discharge high volumes of sanitary sewage. Soil conditions and inadequate land space are not suitable for the satisfactory operation of sub-surface drainage systems.

#### RECOMMENDATIONS

1. Measures should be taken to provide municipal sewage treatment for the community of Brights Grove.
2. The possibility of extending the City of Sarnia sanitary sewer system to serve the commercial area along London Road should be considered.

All of which is respectfully submitted,

District Engineer:

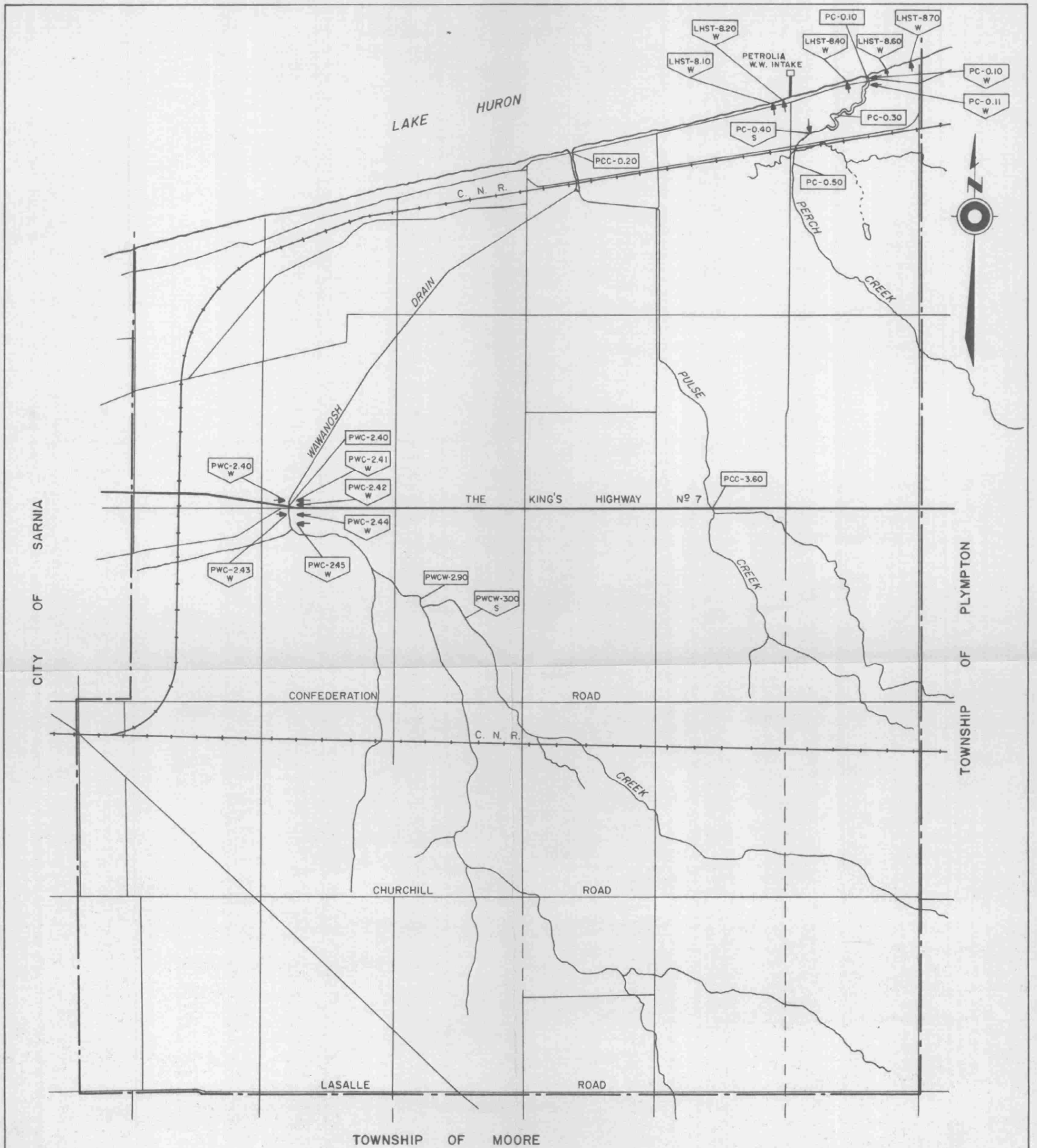
  
C.E. McIntyre, P. Eng.

ec

Prepared by:  
Mr. B. G. Samuel

Approved by:

J.R. Barr, Assistant Director.



# LEGEND

- PC-0.10 - SAMPLING POINT SHOWING STREAM AND MILEAGE
- PC-0.10 - STREAM AND MILEAGE AT OUTFALL  
W - TYPE OF OUTFALL  
S - SANITARY SEWER  
W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

## TOWNSHIP OF SARNIA WATER POLLUTION SURVEY

SCALE: 0 3000 6000 FEET	
DRAWN BY: W.R.E.	DATE: OCTOBER 1965
CHECKED BY:	DRAWING NO: 65-126